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What is claimed is:

1. An isolated mammalian nucleic acid molecule encoding
the Prostate Carcinoma Tumor Antigen Gene-1
protein.
2. A DNA molecule of claim 1.
3. A genomic DNA molecule of claim 2.
4. A cDNA molecule of claim 2.
5. An RNA molecule of claim 1.
6. An isolated human nucleic acid molecule of claim 1.
7. A nucleic acid molecule of at least 15 nucleotides
capable of specifically hybridizing with a unique
sequence of the nucleic acid molecule of claim 1.
8. An antisense oligonucleotide having a sequence
capable of specifically hybridizing to an RNA
molecule encoding the Prostate Carcinoma Tumor
Antigen Gene-1 protein so as to prevent translation
or cause degradation of the RNA molecule.
9. A method of detecting expression of the Prostate
Carcinoma Tumor Antigen Gene-1 in a sample which
contains cells comprising steps of:
 - (a) obtaining total RNA from the cells;
 - (b) contacting the RNA so obtained with a labelled
nucleic acid molecule of claim 7 under
hybridizing conditions; and
 - (c) determining the presence of RNA hybridized to
the molecule, thereby detecting the expression

of the Prostate Carcinoma Tumor Antigen Gene-1
in the sample.

- 5 10. A method of detecting expression of the Prostate Carcinoma Tumor Antigen Gene-1 in tissue sections which comprises steps of:
 - 10 (a) contacting the tissue sections with a labelled nucleic acid molecule of claim 7 under hybridizing conditions permitting hybridization of the molecule of claim 7 and the RNA of Prostate Carcinoma Tumor Antigen Gene-1; and
 - 15 (b) determining the presence of RNA hybridized to the molecule of claim 7, thereby detecting the expression of the Prostate Carcinoma Tumor Antigen Gene-1 in tissue sections.
- 20 11. An isolated mammalian nucleic acid molecule of claim 2 operatively linked to a promoter of RNA transcription.
- 25 12. A vector which comprises the isolated mammalian nucleic acid molecule of claim 1.
13. A plasmid of claim 12.
- 25 14. A virus of claim 12.
15. A DNA virus of claim 14.
- 30 16. An RNA virus of claim 14.
17. A retrovirus of claim 14.
- 35 18. The plasmid of claim 13 designated PCTA-1, having ATCC Accession No. 97021.

19. A host vector system for the production of a polypeptide having the biological activity of a mammalian Prostate Carcinoma Tumor Antigen Gene-1 protein which comprises the vector of claim 12 and a suitable host.
20. A host vector system of claim 19, wherein the suitable host is selected from a group consisting of a bacterial cell, an insect cell, a plant cell and a mammalian cell.
21. A method of producing a polypeptide having the biological activity of a mammalian Prostate Carcinoma Tumor Antigen Gene-1 protein which comprises growing the host cells of the host vector system of claim 16 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.
22. A method of transforming cells which comprises introducing a vector of claim 12 into an appropriate host cell.
23. Transformed cells of claim 22.
24. Purified mammalian Prostate Carcinoma Tumor Antigen Gene-1 protein.
25. A polypeptide encoded by the isolated mammalian nucleic acid molecule of claim 1.
26. An antibody capable of specifically binding to the mammalian Prostate Tumor Inducing Gene-1 protein of claims 20 or 21.

27. A monoclonal antibody of claim 26.
28. A compound capable of competitively inhibiting the binding of the antibody of claim 26 or 27 with the mammalian Prostate Tumor Inducing Gene-1 protein.
29. A pharmaceutical composition comprising the antibody of claim 26 or 27 or the compound of claim 28 and a pharmaceutically acceptable carrier.
30. A therapeutic agent comprising an antibody of claim 26 or 27 and a cytotoxic agent.
31. A therapeutic agent of claim 30, wherein the cytotoxic agent is either a radioisotope or toxin.
32. A method for measuring the amount of the mammalian Prostate Carcinoma Tumor Antigen Gene-1 protein in a biological sample comprising steps of:
- (a) contacting the sample with the antibody of claim 26 or 27 under conditions permitting formation of a complex between said antibody and the mammalian Prostate Carcinoma Tumor Antigen Gene-1 protein, and
- (b) measuring the amount of said complex, thereby measuring the amount of the Prostate Carcinoma Tumor Antigen Gene-1 protein in said biological sample.
33. A method for measuring the amount of the mammalian Prostrate Carcinoma Tumor Antigen Gene-1 protein in a biological sample comprising steps of:
- (a) contacting the sample with a capturing monoclonal antibody capable of binding to the mammalian Prostrate Carcinoma Tumor Antigen

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- Gene-1 protein and is bound on a solid matrix under conditions permitting formation of a complex between the mammalian Prostrate Carcinoma Tumor Antigen Gene-1 protein and the bound antibody;
- 5 (b) removing the unbound sample;
- (c) contacting the solid matrix with a secondary antibody which is capable of binding to the mammalian Prostrate Carcinoma Tumor Antigen
- 10 Gene-1 protein in at least one site other than the capturing antibody; and
- (d) measuring the amount of said complex, thereby measuring the amount of the Prostate Carcinoma Tumor Antigen Gene-1 protein in said biological
- 15 sample.
34. A method of claim 33, further comprising before step d, contacting a tertiary antibody which is labelled with a detectable marker and capable of binding the
- 20 secondary antibody.
35. A method of claim 32, 33 or 34 wherein the sample is a serum sample.
- 25 36. A method to determining whether a subject carries a cancer with metastatic potential comprising steps of:
- (a) measuring the amount of Prostate Carcinoma Tumor Antigen Gene-1 protein in the serum
- 30 sample of the subject; and
- (b) comparing the amount determined in step (a) with the amount determined from the sample of a healthy subject or a subject with benign tumor.

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37. A method for determining whether a compound is capable of inhibiting the expression or activity of Prostate Carcinoma Tumor Antigen Gene-1 protein comprising steps of:
- 5 (a) contacting the transformed cells of claim 19 with an appropriate amount of the compound under conditions permitting the compound to inhibit expression or activity of Prostate Carcinoma Tumor Antigen Gene-1 protein; and
- 10 (b) detecting the level of the Prostate Carcinoma Tumor Antigen Gene-1 protein expression, a decrease in the expression level indicating that the compound is capable of inhibiting the expression or activity of Prostate Carcinoma
- 15 Tumor Antigen Gene-1 protein.
38. A method for determining whether a compound is capable of specifically binding to the Prostate Carcinoma Tumor Antigen Gene-1 protein comprising
- 20 steps of:
- (a) contacting an appropriate amount of the purified protein of claim 20 with an appropriate amount of the compound under conditions permitting formation of a complex
- 25 between the compound and the purified protein;
- (b) detecting such complex, the presence of the complex indicating that the compound is capable of binding to the Prostate Carcinoma Tumor Antigen Gene-1 protein.
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39. A pharmaceutical composition comprising an effective amount of the compound capable of either binding or inhibiting the activity of the Prostate Carcinoma Tumor Antigen Gene-1 protein as determined by method
- 35 of claim 31 or 32 and a pharmaceutical carrier.

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40. A method of treating cancer with metastatic potential in a subject comprising administering effective amount of the pharmaceutical composition of claim 29, therapeutic agent of claim 30 or 31, the pharmaceutical composition of 39, alone or in combination of, to the subject.
41. An isolated mammalian nucleic acid molecule having the sequence of Prostate Tumor Inducing Gene-1.
42. A DNA molecule of claim 41.
43. A genomic DNA molecule of claim 41.
44. A cDNA molecule of claim 41.
45. ~~An~~ RNA molecule of claim 41.
46. An isolated human nucleic acid molecule of claim 41.
47. A nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a sequence of the nucleic acid molecule of claim 41.
48. An antisense oligonucleotide having a sequence capable of specifically hybridizing to an RNA molecule encoding the Prostate Tumor Inducing Gene-1 protein so as to prevent translation of the RNA molecule.
49. An antisense oligonucleotide having a sequence capable of inactivating the expression of the 5'-UTR of Prostate Tumor Inducing Gene-1 sequence.

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50. A method of detecting expression of the Prostate Tumor Inducing Gene-1 in a sample which contains cells which comprises steps of:
- 5 (a) obtaining total RNA from the cell, contacting the RNA so obtained with a labelled nucleic acid molecule of claim 47 under hybridizing conditions; and
 - 10 (b) determining the presence of RNA hybridized to the molecule, thereby detecting the expression of the Prostate Tumor Inducing Gene-1 in the sample.
51. A method of detecting expression of the Prostate Tumor Inducing Gene-1 in tissue sections which
- 15 comprises steps of
 - (a) contacting the tissue sections with a labelled nucleic acid molecule of claim 47 under hybridizing conditions; and
 - 20 (b) determining the presence of RNA hybridized to the molecule, thereby detecting the expression of the Prostate Tumor Inducing Gene-1 in tissue sections.
52. An isolated mammalian nucleic acid molecule of claim
- 25 41 operatively linked to a promoter of RNA transcription.
53. A vector which comprises the isolated mammalian nucleic acid molecule of claim 41.
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54. A plasmid of claim 53.
55. The plasmid of claim 53 designated PTI-1 having ATCC Accession No. 97020.
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56. A virus of claim 54.
57. A DNA virus of claim 54.
- 5 58. An RNA virus of claim 54.
59. A retrovirus of claim 54.
- 10 60. A host vector system for the production of a polypeptide having the biological activity of the mammalian Prostate Tumor Inducing Gene-1 protein which comprises the vector of claim 53 and a suitable host.
- 15 61. A host vector system of claim 60, wherein the suitable host is a bacterial cell, insect cell, plant cell or mammalian cell.
- 20 62. A method of producing a polypeptide having the biological activity of a mammalian Prostate Tumor Inducing Gene-1 protein which comprises growing the host cells of the host vector system of claim 61 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so
- 25 produced.
63. A mammalian cell comprising the vector of claim 53.
64. Purified mammalian Prostate Tumor Inducing Gene-1
- 30 protein.
65. A polypeptide encoded by the isolated mammalian nucleic acid molecule of claim 41.
- 35 66. A method to produce antibody using the mammalian

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Prostate Tumor Inducing Gene-1 protein of claim 64 or 65.

- 5 67. An antibody capable of binding specifically to the mammalian Prostate Tumor Inducing Gene-1 protein of claim 64 or 65.
68. A monoclonal antibody of claim 67.
- 10 69. A pharmaceutical composition comprising an antibody of claim 66 or 67 and a pharmaceutically acceptable carrier.
- 15 70. A therapeutic agent comprising an antibody of claim 66 or 67 and a cytotoxic agent.
71. A therapeutic agent of claim 70, wherein the cytotoxic agent is either a radioisotope or toxin.
- 20 72. An immunoassay for measuring the amount of a mammalian Prostate Tumor Inducing Gene-1 protein in a biological sample comprising steps of:
- 25 a) contacting the biological sample with the antibody of claim 66 or 67 under the condition permitting the formation of a complex with said antibody and the mammalian Prostate Tumor Inducing Gene-1 protein, and
- 30 b) measuring the amount of said complex, thereby measuring the amount of the Prostate Tumor Inducing Gene-1 protein in said biological sample.
73. An isolated mammalian nucleic acid molecule having the sequence of Prostate Tumor Inducing Gene-2.

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74. A DNA molecule of claim 73.
75. A genomic DNA molecule of claim 73.
- 5 76. A cDNA molecule of claim 73.
77. An RNA molecule of claim 63.
78. An isolated human nucleic acid molecule of claim 73.
- 10 79. A nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a unique sequence of the nucleic acid molecule of claim 73.
- 15 80. An antisense oligonucleotide having a sequence capable of inactivating the expression of the 5'-UTR of the Prostate Tumor Inducing Gene-2 protein sequence.
- 20 81. An isolated mammalian nucleic acid molecule of claim 73 operatively linked to a promoter of RNA transcription.
- 25 82. A vector which comprises the isolated mammalian nucleic acid molecule of claim 73.
83. A plasmid of claim 82.
84. The plasmid of claim 83 designated PTI-2 having ATCC
30 Accession No. 69742.
85. A virus of claim 82.
86. A DNA virus of claim 82.
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87. An RNA virus of claim 82.
88. A retrovirus of claim 82.
- 5 89. An isolated mammalian nucleic acid molecule having the sequence of Prostate Tumor Inducing Gene-3.
90. A DNA molecule of claim 89.
- 10 91. A genomic DNA molecule of claim 89.
92. A cDNA molecule of claim 89.
93. An RNA molecule of claim 89.
- 15 94. An isolated human nucleic acid molecule of claim 89.
95. A nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a unique sequence of the nucleic acid molecule of claim 86.
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96. An antisense oligonucleotide having a sequence capable of specifically hybridizing to an RNA molecule encoding the Prostate Tumor Inducing Gene-3 protein so as to prevent translation or cause degradation of the RNA molecule.
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97. An antisense oligonucleotide having a sequence capable of inactivating the expression of the 5'-UTR of the Prostate Tumor Inducing Gene-3 protein sequence.
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98. A method of detecting expression of a Prostate Tumor Inducing Gene-3 in a sample which contains cells which comprises steps of:
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- (a) obtaining total RNA from the cell, contacting the RNA so obtained with a labelled nucleic acid molecule of claim 92 under hybridizing conditions; and
- 5 (b) determining the presence of RNA hybridized to the molecule, thereby detecting the expression of the Prostate Tumor Inducing Gene-3 in the sample.
- 10 99. A method of detecting expression of a Prostate Tumor Inducing Gene-3 in tissue sections which comprises steps of
- (a) contacting the tissue sections with a labelled nucleic acid molecule of claim 95 under
- 15 hybridizing conditions; and
- (b) determining the presence of RNA hybridized to the molecule, thereby detecting the expression of the Prostate Tumor Inducing Gene-3 in tissue sections.
- 20 100. An isolated mammalian nucleic acid molecule of claim 89 operatively linked to a promoter of RNA transcription.
- 25 101. A vector which comprises the isolated mammalian nucleic acid molecule of claim 89.
102. A plasmid of claim 101.
- 30 103. The plasmid of claim 102 designated PTI-3 having ATCC Accession No. 97022.
104. A virus of claim 102.
- 35 105. A DNA virus of claim 102.

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106. An RNA virus of claim 102.
107. A retrovirus of claim 102.
- 5 108. A host vector system for the production of a polypeptide having the biological activity of a mammalian Prostate Tumor Inducing Gene-3 protein which comprises the vector of claim 96 and a suitable host.
- 10 109. A host vector system of claim 108, wherein the suitable host is a bacterial cell, insect cell, plant cell or mammalian cell.
- 15 110. A method of producing a polypeptide having the biological activity of a mammalian Prostate Tumor Inducing Gene-3 protein which comprises growing the host cells of the host vector system of claim 109 under suitable conditions permitting production of
- 20 the polypeptide and recovering the polypeptide so produced.
111. A mammalian cell comprising the vector of claim 101.
- 25 112. Purified mammalian Prostate Tumor Inducing Gene-3 protein.
113. A polypeptide encoded by the isolated mammalian nucleic acid molecule of claim 89.
- 30 114. A method to produce antibody using the mammalian Prostate Tumor Inducing Gene-1 protein of claim 112 or 113.
- 35 115. An antibody capable of binding specifically to the

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mammalian Prostate Tumor Inducing Gene-1 protein of claim 112 or 113.

116. A monoclonal antibody of claim 115.

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117. A pharmaceutical composition comprising an antibody of claim 114 or 115 and a pharmaceutically acceptable carrier.

10 118. A therapeutic agent comprising an antibody of claim 114 or 115 and a cytotoxic agent.

119. A therapeutic agent of claim 118, wherein the cytotoxic agent is either a radioisotope or toxin.

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120. An immunoassay for measuring the amount of a mammalian Prostate Tumor Inducing Gene-3 protein in a biological sample comprising steps of:

- 20 a) contacting the biological sample with the antibody of claim 114 or 115 under the condition permitting the formation of a complex with said antibody and the mammalian Prostate Tumor Inducing Gene-3 protein, and
- 25 b) measuring the amount of said complex, thereby measuring the amount of the Prostate Tumor Inducing Gene-3 protein in said biological sample.

30 121. A method of inactivating oncogenic transformation of cells comprising inactivating the expression of the 5'-UTR of Prostate Tumor Inducing Gene-1, -2 or -3.

35 122. A method of claim 121, wherein the inactivation is carried out by using the antisense oligonucleotide having a sequence capable of inactivating the

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complete or a portion of the 5'-UTR of Prostate Tumor Inducing Gene-1 sequence.

- 5 123. A method of claim 121, wherein the inactivation is carried out by using the antisense oligonucleotide having a sequence capable of inactivating the complete or a portion of the 5'-UTR of Prostate Tumor Inducing Gene-2 sequence.
- 10 124. A method of claim 121, wherein the inactivation is carried out by using the antisense oligonucleotide having a sequence capable of inactivating the complete or a portion of the 5'-UTR of Prostate Tumor Inducing Gene-3 sequence.
- 15 125. A method of claim 122, 123, or 124 wherein the antisense oligonucleotide is introduced to cells by a retroviral vector.
- 20 126. A method of claim 122, 123, or 124 wherein the antisense oligonucleotide is introduced to cells by a DNA virus vector.
- 25 127. A method of claim 122, 123, or 124 wherein the antisense oligonucleotide is introduced to cells by an RNA virus vector.